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EXAMINER	
LU, FRANK WEI MIN	

ART UNIT	PAPER NUMBER
1634	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/664,000	MIR, KALIM	
	Examiner	Art Unit	
	FRANK W. LU	1634	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 April 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-136* is/are pending in the application.

4a) Of the above claim(s) *5,6,27-123 and 125-135* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4,7-26,124 and 136* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *16 September 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☒ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Applicant's election of species (3) (the density of functional molecules is reduced by labeling some of the plurality of molecules, see claim 7) and species (4) (the molecules are defined chemical entities, oligonucleotides, polynucleotides, conjugated polymers, small organic molecules or analogues, mimetics or conjugates thereof, see claims 20 and 21) in the reply filed on April 22, 2008 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)). Since applicant elected Group I, claims 1-26, 124, 125, and 136 in the response filed on January 12, 2007, claim 125 is dependent on claim 106 which is a nonelected claim, claims 1-4, 7-26, 124, and 136 will be examined.

Priority

2. Acknowledgment is made of applicant's claim for foreign priority based on two applications, GB0106635.6, and GB0118879.6, filed in United Kingdom on March 16, 2001 and June 2, 2001 respectively. It is noted, however, that applicant has not filed certified copies of these application as required by 35 U.S.C. 119(b).

Specification

3. The amendment filed on September 16, 2003 is objected to under 35 U.S.C. 132(a) because it introduces new matter into the disclosure. 35 U.S.C. 132(a) states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows: the original filed specification was filed before

September 21, 2004 and did not indicate to incorporate PCT Application No. PCT/GB02/01245, GB0106635.6, and GB0118879.6 by reference. See MPEP 608.04.

Applicant is required to cancel the new matter in the reply to this Office Action.

4. The disclosure is objected to because it contains an embedded hyperlink and/or other form of browser-executable code. For example, see page 85 of the specification. Applicant is required to delete the embedded hyperlink and/or other form of browser-executable code. See MPEP § 608.01.

5. The disclosure is objected to because of the following informalities: (1) there are Figures 5a to 5c, 6A, and 6B. However, Brief description of the Figures of the specification only describes Figures 5 and 6; (2) page 47 should be replace since some words in line 10 of this page are hard to read; and (3) there are three nucleotide sequences having more than 10 nucleotides in pages 98 and 122. However, there are no SEQ ID NOs for these nucleotide sequences in pages 98 and 122.

Appropriate correction is required.

Claim Objections

6. Claims 2, 3, 7-26, 124, and 136 are objected to because of the following informality: "A method" should be "The method".

7. Claim 18 is objected to because of the following informality: note that "SPM" is an abbreviation. It can only be used after whole phrase representing the abbreviation appears once.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

8. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

9. Claims 1-4, 7-26, 124, and 136 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

10. Claim 1 is rejected as vague and indefinite. Since the claim does not contain a determining step, it is unclear why the identity of each molecule is determined prior to immobilization. Please clarify.

11. Claim 3 is rejected as vague and indefinite because it is unclear that dilution solutions are from what. Please clarify.

12. Claim 4 is rejected as vague and indefinite. Since step (i) does not require functional immobilized molecules, it is unclear why the density of functional immobilized molecules in the array can be reduced as recited in step (ii). Furthermore, since the claim does not contain a determining step, it is unclear why the identity of each molecule is determined prior to immobilization. In addition, it is unclear that each molecule in step (ii) means each of a plurality of molecules immobilized to a solid phase in step (i) or means each of functional immobilized molecules in step (ii). Please clarify.

13. Claim 4 recites the limitation "the resulting array" in the claim. There is insufficient antecedent basis for this limitation in the claim because there is no phrase "resulting array" before "the resulting array". Please clarify.

14. Claim 7 is rejected as vague and indefinite because the density of functional molecules cannot be reduced by only labeling some of the plurality of molecules as recited in claim 7. Please clarify.

15. Claim 8 or 22 or 25 is rejected as vague and indefinite because it is unclear that the immobilized molecule means each of a plurality of molecules immobilized to a solid phase in step (i) of claim 4 or means each of functional immobilized molecules in step (ii) of claim 4. Please clarify.

16. Claim 9 is rejected as vague and indefinite because it is unclear that unintended structures in what molecules are substantially absent. Please clarify.

17. Claim 10 is rejected as vague and indefinite because it is unclear that a plurality of molecular species and other molecular species are from the immobilized molecules or not. Please clarify.

18. Claim 11 or 12 is rejected as vague and indefinite because it is unclear that a plurality of molecules is from functional immobilized molecules in claim 4 or not. Please clarify.

19. Claim 13 or 14 or 15 is rejected as vague and indefinite because it is unclear that the molecule means each of a plurality of molecules immobilized to a solid phase in step (i) of claim 4 or means each of functional immobilized molecules in step (ii) of claim 4. Please clarify.

20. Claim 22 is rejected as vague and indefinite. Since claim 1 or 4 does not indicate that the solid phrase has discrete spatially addressable elements, it is unclear why the immobilized molecules are present within discrete spatially addressable elements and each element comprises a distinct spatially addressable microelectrode or nanoelectrode as recited in claim 22. Please clarify.

21. Claim 25 is rejected as vague and indefinite. Since claim 1 or 4 does not indicate that the solid phrase has a single electrode, it is unclear why the immobilized molecules are immobilized onto a single electrode as recited in claim 25. Please clarify.

22. Claim 26 is rejected as vague and indefinite because it is unclear that an immobilized molecule means each of a plurality of molecules immobilized to a solid phase in step (i) of claim 4 or means each of functional immobilized molecules in step (ii) of claim 4. Please clarify.

23. Claim 26 is rejected as vague and indefinite because it is unclear that an immobilized molecule is identical to one of immobilized molecules in claim 1 or not. Please clarify.

24. Claim 124 is rejected as vague and indefinite. Since claims 1-4 and 7-26 do not require probes, it is unclear why which probes are grouped according to their Tm as recited in claim 124. Please clarify.

25. Claim 136 is rejected as vague and indefinite. Since claims 1-4 and 7-26 do not require probes and target binding or assay, it is unclear why the probe is labeled or marked and signal after target binding or assay is only deemed real when it is co-incident with the label(s) or mark(s) on the probe as recited in claim 136. Please clarify.

Claim Rejections - 35 USC § 102

26. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

27. Claims 1-3, 8, 9, 11-18, 20, and 21 are rejected under 35 U.S.C. 102(b) as being anticipated by Balasubramanian *et al.,* (WO 00/06770, published on February 10, 2000).

Regarding claim 1, Balasubramanian *et al.,* teach immobilizing to a solid phase a plurality of molecules (ie., polynucleotides) at a density which allows individual immobilized molecules to be individually resolved, wherein each molecule in the array is spatially addressable and the identity of each molecule is known (ie., known sequence) or determined prior to immobilization as recited in claim 1 (see pages 2-4 and claims 1-21 in pages 20 and 21).

Regarding claims 2 and 3, since Balasubramanian *et al.,* teach that the array is produced by dispensing small volumes of a sample containing a mixture of molecules onto a suitably prepared solid surface, or by applying a dilute solution to the solid surface to generate a random array (see page 7, lines 9-16), Balasubramanian *et al.,* disclose that the molecules are applied to the solid phase by a method selected from printing, electronic addressing, *in situ* light-directed synthesis, ink jet synthesis or physical masking as recited in claim 2 wherein the molecules are applied to the solid phase by printing of dilute solutions as recited in claim 3.

Regarding claims 8 and 9, Balasubramanian *et al.,* teach that the immobilized molecules are present within discrete spatially addressable elements (ie., microsphere) (see page 8, lines 22-28 and Figure 2) and the structure of molecules present in each discrete spatially addressable element is known and unintended structures are substantially absent as recited in claim 9 (see claims 1-21 in pages 20 and 21).

Regarding claims 11, 12, and 15-18, Balasubramanian *et al.,* teach that the plurality of molecules which are capable of being individually resolved are capable of being resolved by optical means (ie., confocal scanning microscopy) as recited in claim 11 wherein the plurality of

molecules which are capable of being individually resolved are capable of being resolved by scanning probe microscopy (ie., confocal scanning microscopy) as recited in claim 12, the molecules comprise a detectable label (ie., fluorescent label) as recited in claim 15 wherein the label can be read by optical methods (ie., using confocal scanning microscopy) as recited in claim 16 and the label is a single fluorescent molecule, nanoparticle or nanorod, or a plurality of fluorescent molecules, nanoparticles or nanorods as recited in claim 17 (see pages 6 and 7). Since it is known that atomic force microscopy is scanning probe microscopy (SPM) (see the definition for scanning probe microscopy from Wikipendia, the free encyclopedia), Balasubramanian *et al.,* teach that the label can be read by SPM (ie., atomic force microscopy) as recited in claim 18 (see page 7).

Regarding claims 13 and 14, Balasubramanian *et al.,* teach that the molecules are attached to the solid phase at a single defined point as recited in claim 13 and the molecules are attached to the solid phase at two or more points (ie., three points via a microsphere) as recited in claim 14 (see page 8, lines 22-28 and Figure 2).

Regarding claims 20 and 21, Balasubramanian *et al.,* teach that the molecules are selected from defined chemical entities, oligonucleotides, polynucleotides, peptides, polypeptides, conjugated polymers, small organic molecules or analogues, mimetics or conjugates thereof as recited in claim 20 (see page 6). Since Balasubramanian *et al.,* teach that oligonucleotides on the array are chemically synthesized based on cDNA or genomic sequence (see page 14) and hybridize to an organism genomic DNA (see claim 32 in page 22), Balasubramanian *et al.,* disclose that the molecules are cDNAs and/or genomic DNA as recited in claim 21.

Therefore, Balasubramanian *et al.,* teach all limitations recited in claims 1-3, 8, 9, 11-18, 20, and 21.

Claim Rejections - 35 USC § 103

28. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

29. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Balasubramanian *et al.,* as applied to claims 1-3, 8, 9, 11-18, 20, and 21 above, and further in view of Shultz *et al.,* (US Patent No. 6,268,146 B1, filed on November 22, 1999).

The teachings of Balasubramanian *et al.,* have been summarized previously, *supra.*

Balasubramanian *et al.,* do not disclose that each molecular species in an element can be distinguished from other molecular species in the element by means of a label as recited in claim 10. However, Balasubramanian *et al.,* teach that a plurality of molecular species (ie., polynucleotides) are present within one or more elements (ie., microspheres) (see claims 1-21 in pages 20 and 21, and Figure 2).

Shultz *et al.,* teach that different fluorescent labels are used in different nucleic acid probes (see column 18).

Therefore, it would have been *prima facie* obvious to one having ordinary skill in the art at the time the invention was made to have performed the method recited in claim 10 wherein each molecular species (ie., each polynucleotide) in an element can be distinguished from other

molecular species in the element by means of a label in view of the prior art of Balasubramanian *et al.,* and Shultz *et al.*. One having ordinary skill in the art would have been motivated to do so because different fluorescent labels on different nucleic acid probes are used to distinguish different nucleic acid probes (see Shultz *et al.,* column 18, lines 52-67). One having ordinary skill in the art at the time the invention was made would have a reasonable expectation of success to label different nucleic acid probes with different fluorescent labels such that each molecular species in an element can be distinguished from other molecular species in the element by means of a label as recited in claim 10.

30. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Balasubramanian *et al.,* as applied to claims 1-3, 8, 9, 11-18, 20, and 21 above, and further in view of Miyada *et al.,* (US Patent No. 5,256,536, published on October 26, 1993).

The teachings of Balasubramanian *et al.,* have been summarized previously, *supra*.

Balasubramanian *et al.,* do not disclose the label is a non-fluorescent molecule, nanoparticle or nanorod as recited in claim 19.

Miyada *et al.,* teach that either fluorescent dye or non-fluorescent dye is used to label polynucleotide probes (see column 8, lines 30-67).

Therefore, it would have been *prima facie* obvious to one having ordinary skill in the art at the time the invention was made to have performed the method recited in claim 19 wherein the label is a non-fluorescent molecule (ie., non-fluorescent dye) in view of the prior art of Balasubramanian *et al.,* and Miyada *et al.*. One having ordinary skill in the art would have been motivated to do so because the simple substitution of one kind of label (ie., fluorescent dye taught by Balasubramanian *et al.,*) from another kind of label (ie., non-fluorescent dye taught by Miyada *et al.,*) during the process of performing the method recited in claim 18, in the absence of convincing evidence to the contrary, would have been *prima facie* obvious to one having ordinary skill in the art at the time the invention was made since the fluorescent dye taught by Balasubramanian *et al.,* and the non-fluorescent dye taught by Miyada *et al.,* are used for the same purpose (ie., labeling polynucleotide probes) and exchangeable.

Furthermore, the motivation to make the substitution cited above arises from the expectation that the prior art elements will perform their expected functions to achieve their expected results when combined for their common known purpose. Support for making the obviousness rejection comes from the M.P.E.P. at 2144.06, 2144.07 and 2144.09.

Also note that there is no invention involved in combining old elements is such a manner that these elements perform in combination the same function as set forth in the prior art without giving unobvious or unexpected results. *In re Rose* 220 F.2d. 459, 105 USPQ 237 (CCPA 1955).

Double Patenting

31. A rejection based on double patenting of the "same invention" type finds its support in the language of 35 U.S.C. 101 which states that "whoever invents or discovers any new and useful process ... may obtain a patent therefor ..." (Emphasis added). Thus, the term "same invention," in this context, means an invention drawn to identical subject matter. See *Miller v.*

Eagle Mfg. Co., 151 U.S. 186 (1894); *In re Ockert*, 245 F.2d 467, 114 USPQ 330 (CCPA 1957); and *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970).

A statutory type (35 U.S.C. 101) double patenting rejection can be overcome by canceling or amending the conflicting claims so they are no longer coextensive in scope. The filing of a terminal disclaimer cannot overcome a double patenting rejection based upon 35 U.S.C. 101.

32. Claims 1-4, 7-17, and 20-26 are provisionally rejected under 35 U.S.C. 101 as claiming the same invention as that of claims 1-4, 7-17, 19, 20, and 26-30 of copending Application No. 11/085,679. This is a provisional double patenting rejection since the conflicting claims have not in fact been patented.

Conclusion

33. No claim is allowed.

34. Papers related to this application may be submitted to Group 1600 by facsimile transmission. Papers should be faxed to Group 1600 via the PTO Fax Center. The faxing of such papers must conform with the notices published in the Official Gazette, 1096 OG 30 (November 15, 1988), 1156 OG 61 (November 16, 1993), and 1157 OG 94 (December 28, 1993)(See 37 CAR § 1.6(d)). The CM Fax Center number is (571)273-8300.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Frank Lu, Ph.D., whose telephone number is (571)272-0746. The examiner can normally be reached on Monday-Friday from 9 A.M. to 5 P.M.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ram Shukla, can be reached on (571)272-0735.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to (571) 272-0547.

/Frank W Lu /
Primary Examiner, Art Unit 1634
August 4, 2008